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UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Storrs, Connecticut

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Refer to in Subdivision Regulation

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UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Bureau of Soil Conservation
Washington, D.C.

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PREFACE 1/

The mission of the Soil Conservation Service is to assist in the conservation, development, and productive use of the nation's soil, water, and related resources so that all Americans may enjoy:

Quality in the natural resource base for sustained use.

Quality in the environment to provide attractive, convenient, and satisfying places to live, work, and play.

Quality in the standard of living based on community improvement and adequate income.

The social setting in which the work of soil and water conservation is carried on is much different today than it was 40 years ago. In the 1960's attitudes toward conservation began to change. Gradually, people became aware that technological advances were having serious effects on the environment. The effects of pesticides as emphasized in the book Silent Spring by Rachel Carson, pollution of Lake Erie, smog in cities, and oil slicks in the oceans became concerns. These concerns increased in number and intensity in the latter part of the 1960's.

More closely related to the SCS mission are pollution from animals waste, eutrophication of streams and lakes, destruction of fish and wildlife habitat, widespread sedimentation and destructive land use practices. These mounting concerns have been reflected in new environmental legislation, new agencies, new expenditures, increased research, new books, and new organizations.

The new interest in conservation and the environment is more than a fad. A growing population, increased affluence, and mounting concern for the quality of life in America, along with such critical social problems as racial tensions and poverty, are creating new values and a new set of priority goals.

1/ Extracted from "A FRAMEWORK PLAN--Soil and Water Conservation for a Better America", U.S. Department of Agriculture, Soil Conservation Service, Issued October 1971.

INTRODUCTION

This document was prepared to guide Connecticut soil and water conservation districts in a program of assisting local units of government in inventorying, planning, and implementing streambelt systems. It can also serve as a reference for personnel in state and regional planning agencies and to members of town commissions, especially those involved with planning, zoning, conservation, recreation, and beautification.

Some of the material contained in this handbook was previously printed by the U.S. Soil Conservation Service in a document entitled Preliminary Material for Drafting Land Use Regulations for Streambelt Zones, March 10, 1971. In some instances the criteria for delineation of streambelts have been modified or redefined.

Streambelts - A System of Natural Environmental Corridors in Connecticut

The quality of the environment for the people of Connecticut is to a great degree linked to the streams and their associated lands - "streambelt environmental corridors". In these corridors of land and water are vital natural resources that deserve priority consideration with respect to land use planning and management.

For most towns, there is still time to conserve and develop the natural resources of the streambelt corridors. For the most part, urban buildup has not encroached to the point where few streambelt possibilities exist.

However, in virtually every town there is evidence of irretrievable destruction of streambelts. The expected population growth and resultant urbanization will greatly increase the hazard of uncontrolled development in these areas if action to protect them is postponed.

The components of streambelts are:

1. Critical components

- a. The watercourse of a defined stream including banks, bed, and water.
- b. Lands subject to stream overflow.
- c. Associated wetlands.
- d. Shorelines of lakes and ponds associated with the stream.
- e. Areas in proximity of streams where certain developments or land uses probably would have adverse effects, i.e. pollution and health hazards, erosion and sedimentation, destruction of ecological systems.

2. Optional components

- a. Contiguous lands with special environmental values, i.e. wildlife habitat, esthetic, public recreation, scenic, historic, etc.
- b. Potential water development sites of public significance.
- c. Other areas necessary as links to form a continuous streambelt system.

Objectives

The objective of a streambelt system is the identification, development, and management of a network of environmental corridors according to standards that curtail pollution and siltation, reduce hazard of flood loss, provide quality recreation areas, promote scenic beauty, and protect important ecosystems. Streambelts are intended to provide features that promote a satisfying environment and to serve the needs of people for open space.

Empirical studies, particularly those of Phillip Lewis, 1/ have shown that frequently the most significant environmental resources are concentrated in a lineal pattern, generally within and along the walls of stream valleys. Lewis calls these concentrations "environmental corridors". This pattern occurs because generally such resources are now or at one time were water-related. As a result, watercourses, floodplains, steep slopes, poorly drained soils, wetlands, aquifer outcrops, important wildlife habitats, historic sites, and areas of scenic beauty may combine into a system with fairly distinct boundaries. Such an area could only be considered the least tolerant to development because of its ecological importance, its scenic beauty, its recreational value, and its long-term economic value in preserving the quantity and quality of the water supply and in reducing the risks and hazards of development. Public policy, therefore would call for retaining such areas in their open space condition. 2/

1/ Phillip H. Lewis, Jr., Regional Design for Human Impact (Kaukauna, Wisconsin: Thomas Publications, Ltd. 1969)

2/ Environmental Corridors were discussed briefly in the American Society of Planning Officials Report Environmental Information for Policy Formulation, Capital Regional Planning Agency Extract.

Consideration Involved in Streambelt Delineation

Soil and water conservation districts can provide guidance to local units of government and help them compile inventory data needed for the development of streambelt systems that fulfill their stated goals. When delineating a streambelt system, some of the items needing consideration are:

Floodplain studies: The streambelt system should include provisions for floodplain management compatible with flood hazards. For some areas, particularly along the rivers and larger streams, this will require floodplain studies such as are made by the U.S. Soil Conservation Service, the U.S. Army Corps of Engineers, and the Water and Related Resources Division of the Connecticut Department of Environmental Protection.

Open space plans: Open space and recreation needs based on expected population concentrations.

Reservoir site studies: The identification of water impoundment sites for future development for purposes such as recreation, fish and wildlife, floodwater storage, water supply, fire protection, etc.

Favorable groundwater storage areas (aquifers): From information derived from maps and data produced by the U.S. Geological Survey.

Historic, scientific, and scenic features: Location, identification, and evaluation of historic, scientific, and scenic features, especially those in proximity to streams. This should also include features of geological or archeological nature. The State Archeologist at the University of Connecticut and the State Historical Commission can furnish information of value.

Wildlife habitat studies: Inventory and evaluation of various kinds of wildlife habitat, especially those provided by the Connecticut Department of Environmental Protection. Special consideration is required for locally endangered species.

Critical erosion areas: Identification of areas of accelerated erosion, especially those contributing to the siltation of wetlands and the sediment load of streams and reservoirs.

Stream water quality inventory: Identification and evaluation of stream water quality according to water quality standards adopted by the State of Connecticut.

Areas with good potential for sand or gravel: Derived from information provided by the Connecticut Department of Transportation, U.S. Geological Survey, and Soil Conservation Service.

Conservation Involvement in Watershed Pollution

Land use Inventory: Identification of the important land uses in areas near streams. Locations of gravel pits, quarries, or other types of extraction operations are of special significance.

Soil survey: Detailed soil maps (of the National Cooperative Soil Survey) will supply much of the data needed to delineate the streambelt corridors. This was recognized by the 1971 general assembly by enactment of Public Act 132, concerning the use of the soil mapping service. Likewise, soil characteristics should be a major consideration in determining appropriate use and preservation of these natural resources. Many of these considerations are reflected in Public Act 155, Inland Wetlands and Watercourses Act.

Inventory Process

The process of environmental corridor inventorying, planning, and development is not accomplished in a vacuum. It is a continuing process in which local people participate. Local people establish objectives, take stock of their resource potentials, make plans, set priorities, and carry out planned steps necessary to reach their objectives for environmental quality.

Request for assistance: Towns and other units of government obtain assistance on the streambelt program by making a request to their local soil and water conservation district. These requests are normally made by a letter which briefly outlines objectives, problems, and potentials for a streambelt system as well as indicates their desire to plan and implement the streambelt concept. The district then replies in writing to the unit of government and gives them some idea of timing and the kind and amount of technical assistance available. The district also requests that a layman group be appointed to work with the district in preparing the inventory.

Information meeting: Following district approval and establishment of priorities, an information and discussion meeting will be arranged with town officials and interested local people. This is an opportunity to help local people increase their knowledge and understanding of the potentials of their resources.

Another objective of the meeting is to identify the amount and kinds of involvement that the local people will have in the inventory and planning process. For example, the town historic society can assist with identification of sites in the streambelts. The recreation and conservation commissions have considerable knowledge about recreation, wildlife, esthetic, and scenic aspects of the town.

Delineation of streambelts: The actual identification of streambelts is made by a combination of map studies and field visits by technicians working with a local committee. Soil survey maps, topographic maps, aerial photographs, and reports on the natural resource aspects of the town are used in the study.

Planning a Streambelt System

In the interest of public health, safety, and welfare, a streambelt system is intended to conserve natural resources of vital significance, permitting and encouraging the wise use of these resources. Most of the items listed under Considerations Involved in Streambelt Delineation are helpful in planning streambelt systems. In advancing these principles, the specific intents are:

1. To promote such developments or land uses that would not have probable adverse environmental effects.
2. To promote the health, safety, and welfare of residents and property owners near streams and in areas subject to flooding, and to prevent further occupancy in floodprone areas.
3. To maintain natural drainage courses sufficient to carry abnormal flows of storm water in periods of heavy precipitation and prevent the future need of excessive public expenditures for water disposal, and to reduce the need for costly flood prevention measures by retention of floodplains and floodprone areas in open space.
4. To maintain a framework of environmental corridors of high quality for public access with close proximity to neighborhood and population centers.
5. To help stabilize stream flow.
6. To protect water quality.
7. To retain sites for beneficial water uses such as flood control, water supply, wildlife habitat, and recreation.
8. To protect areas of importance to the preservation of significant ecological systems.
9. To maintain and encourage the improvement of environmental qualities including beauty, recreational opportunity, plant and animal life, scenic, and other natural values.
10. To preserve areas of unique, scientific, or historic interests and to retain areas with special significance for scientific study, ecological research, and conservation or nature education.

11. To retain contrast in the landscape and provide buffer zones between incompatible land uses.
12. To protect and improve fish and wildlife habitats.
13. To help protect groundwater areas that are important to water supply.

Land Use Determinations

The planning process requires choosing between various possible land uses for each part of a streambelt system. In many instances, multiple use of the same land area is possible. Choices made should reflect the intent of the Connecticut Inland Wetland and Watercourses Act. Soil and water conservation districts can assist in this process by providing information about feasible land uses, based on soil characteristics, to individual land users and units of government.

1. Land Uses Compatible with Soil Characteristics

a. In all areas of the streambelt:

- (1) Wildlife preserves, preservations of scenic, historic, natural, and scientific areas and nature study.
- (2) Forestry and wildlife habitat.

b. In addition to those stated in 'a' above, other uses and operations are compatible in certain areas as follows:

- (1) Natural soil groups A-1a, A-1b, A-1d, A-1e, A-2, B-1a, B-1b, B-1c, B-2, C-1a, C-1b, C-1c, C-2, E-1, and E-2.

Agriculture activities including plant nurseries, cropland, hayland, and livestock pasture (with livestock watering devices) provided erosion and pollution are controlled.

Outdoor recreation uses such as parks, playgrounds, campsites, golf courses, hunting areas, and trails.

Uses that maintain permanent vegetative cover including extensive recreation.

- (2) Natural soil groups A-1c, B-1d, B-1e, C-1d, C-1e, D-1, and D-2. Uses that maintain permanent vegetative cover including extensive recreation.

2. Conditional Land Uses Based on Soil Characteristics

The following land uses will require regulation and the application of a sound conservation plan to avoid undue deterioration of the streambelt.

a. In all areas of the streambelt:

- (1) Highways, roads, utility transmission and pipe lines, dams, bridges, mining, quarrying, earth removal, and dredging.
- (2) Small recreational buildings, boat docks, ramps, etc. (These will be subject to state statutory provisions, local ordinances, and the environmental review procedures.)

b. In addition to those stated in 'a' above, certain other uses are conditional in the following areas:

Natural soil groups A-3, B-3, C-3, E-3, and F-1: embankment, dugout, and bypass ponds for irrigation, recreation, wildlife, etc., level ditching, and other wetland wildlife improvements. (These uses are conditional on conservation plans and engineering designs provided or approved by the soil conservation district or other state resource agencies.)

3. Restricted Land Uses Based on Soil Characteristics

The following land uses generally are not compatible with the objectives of a streambelt system.

a. In all areas of the streambelt:

- (1) Residential, commercial, industrial, and institutional buildings.
- (2) On-site sewage disposal.
- (3) Any solid or liquid waste or refuse disposal including sanitary landfills.
- (4) Junk yards, commercial and industrial storage.
- (5) Barns, stables, feedlots, barnyards, dry lots, poultry buildings, and farm waste disposal.
- (6) Access to watercourses by domestic livestock.

- b. In addition to those uses stated in 'a' above, certain other uses are restricted:

Natural soil groups A-3, B-3, C-3, E-3, and F-1: cropland, hayland, and pasture and drainage and land filling.

Planning is an open ended process that proceeds at more than one level of detail over an extended period of time, with enough flexibility in the plan to take advantage of unforeseen opportunities and to accommodate other contingencies.

Implementing a Streambelt System

An early step in implementing a streambelt system is a public information program. Soil and water conservation districts can assist with such problems. Full use should be made of public meetings and the news media in order to obtain consideration by the public of their objectives with respect to a streambelt program.

Several means of achieving public goals are:

1. Obtain wise land use and natural resource development on public and privately owned lands within streambelts by promoting local participation in the activities of the soil and water conservation district.
2. Public acquisition.
3. Acquisition by private land trusts.
4. Conservation easements.
5. Authorities of the state relating to health and sanitation, water pollution, stream channel encroachment, etc.
6. State regulations such as PA-695 Tidal Wetlands Act, and PA-155 Inland Wetlands and Watercourses Act.
7. Activities performed under U.S. Public Law 566, Small Watershed Protection and Flood Prevention Act.
8. Activities resulting from flood hazard or flood insurance programs.
9. Authorities and activities based on the Resource Conservation and Development (RC&D) program.
10. By reviewing applications and plans for changes in land use within streambelt areas soil and water conservation districts can assist local units of government.

Land use regulations: As a prerequisite to enactment of streambelt regulations, a town should have a comprehensive plan which reflects its objectives for preserving and wisely using the streambelts. The comprehensive plan (consisting of maps and other information) should show in general the areas delineated as the streambelt.

In addition to planning maps, there will need to be an official streambelt map established by the planning and zoning commission (or other designated body) and adopted by the legislative body as part of the streambelt ordinance.

Where this is done, town comprehensive plans may include streambelts consisting of two main categories--a core or streambelt protected by special regulations, and associated areas included in the overall streambelt and controlled only by the normal zoning regulations.

In the second category mentioned above are areas or sites that towns have planned as part of an overall streambelt system, but where special land use controls are not justified or practical. These areas or sites have special or significant values as open space and for public use. For instance, scenic overlooks and features, historic sites, areas with potential for public recreation, etc.

Time is the most important consideration. Each day there is new evidence of damage by encroachment, pollution, or other types of destruction of streambelts. The identification of environmental corridors and wise decisions by local people on how to manage and implement a streambelt will protect the quality of environment in Connecticut.

Soil Survey Criteria for Streambelt Delineation

The following approach utilizes Natural Soil Groups 1/ in the process of streambelt designation and setting forth appropriate uses of these natural resources. It should be recognized that the groupings are used primarily for the purpose of categorizing soils and organization of material. The actual delineations on a town map would be based on the soil boundaries shown on detailed soil survey maps.

Areas in proximity to named streams and their tributaries shown on USGS topographical maps and consisting of the soils as specified in the following groupings shall be included in the streambelts. The watercourses consist of the beds, banks, and water of the named streams and their tributaries.

A-1a, A-1b, Excessively drained terrace soils and well
A1-d, A-1e, drained terrace soils with slopes less than
G-1 15 percent:

Shall include the areas of these soils that because of proximity to the watercourses, the soil patterns, steepness of slope, or surface water drainage require controlled land use to minimize the hazard of pollution, erosion and sedimentation. As a minimum, the streambelt zone shall include these soils that are less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain. Also, it shall include areas of these soils that are within 50 feet of a terrace escarpment that is within the streambelt.

A-1c Terrace escarpments:

Shall include terrace escarpments adjacent to either the watercourse, or its floodplain, or poorly drained or very poorly drained soils contiguous to the watercourse or its floodplain.

A-2 Moderately well drained soils:

Shall include areas of these soils contiguous to the watercourse or its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

A-3, B-3 Poorly and very poorly drained terrace soils:
C-3 _____

Shall include these soils where they are contiguous to either the watercourse or its floodplain.

1/ Know Your Land-Natural Soil Groups for Connecticut
U.S.D.A. Soil Conservation Service and Connecticut
Cooperative Extension Service, No. 71-56

B-1a, B-1b, Well drained upland soils with slopes less than
B-1c, C-1a, 15 percent:
C-1b, C-1c

Sufficient areas of these soils shall be included to provide suitable width and continuity for a streambelt to meet public objectives. As a minimum, the streambelt shall include these soils less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

B-1d, B-1e Well drained upland soils with slopes more than
C-1d, C-1e 15 percent:

Shall include the areas of these soils that because of proximity to the watercourse, the soil patterns, or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation. As a minimum, the streambelts shall include areas of these soils that are contiguous to the watercourse or its floodplain, and which are within 200 feet of the watercourse, its floodplain or poorly drained or very poorly drained soils contiguous to the watercourse or its floodplain.

B-2, C-2 Moderately well drained upland soils:

Shall include sufficient areas of these soils to provide suitable width and continuity for streambelt to meet public objectives. As a minimum, the streambelt shall include these soils that are less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

D-1 Rocky and very rocky upland soils with slopes
less than 15 percent:

Shall include areas of these soils where proximity to the watercourse, soil patterns, or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation. As a minimum, it shall include these soils which are contiguous to the watercourse or its floodplain and which are within 200 feet of the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

D-2 Rocky and very rocky upland soils with slopes
more than 15 percent, and extremely rocky soils:

Shall include areas of these soils where proximity to the watercourse and soil pattern or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation.

As a minimum, it shall include these soils that are contiguous to the watercourse or its floodplain, and which are less than 300 feet from the watercourse, its floodplain or poorly drained or very poorly drained soils contiguous to the watercourse or its floodplain.

E Floodplain soils:

Shall include all floodplain soils.

F Marsh and swamp soils:

Shall include the area of these soils which adjoin the watercourse or its floodplain.

Connecticut Natural Soil Groups Legend

A - TERRACE SOILS -- OVER SANDS AND GRAVELS

- A-1 Excessively drained to well drained soils
- A-1a Excessively drained soils with slopes less than 8 percent
- A-1b Excessively drained soils with irregular slopes between 3 and 15 percent, or smooth slopes between 8 and 15 percent
- A-1c Excessively drained soils with slopes above 15 percent
- A-1d Well drained soils with slopes less than 8 percent
- A-1e Well drained soils with slopes between 8 and 15 percent
- A-2 Soils with moderately high seasonal water table
- A-3 Poorly and very poorly drained soils
- A-3a Soils with high seasonal water table
- A-3b Soils with high water table during most of the year

B - UPLAND SOILS -- OVER FRIABLE TO FIRM GLACIAL TILL

- B-1 Well drained soils
- B-1a Non-stony and stony soils with slopes less than 8 percent
- B-1b Non-stony and stony soils with slopes between 8 and 15 percent
- B-1c Very stony soils with slopes less than 15 percent
- B-1d Non-stony and stony soils with slopes above 15 percent
- B-1e Very stony soils with slopes above 15 percent

- B-2 Moderately well drained soils
- B-2a Non-stony and stony soils with moderately high seasonal water table
- B-2b Very stony soils with moderately high seasonal water table
- B-3 Poorly and very poorly drained soils
- B-3a Non-stony and stony soils with high seasonal water table
- B-3b Soils with high water table during most of the year
- C - UPLAND SOILS -- OVER COMPACT GLACIAL TILL (HARDPAN)
 - C-1 Well drained soils
 - C-1a Non-stony and stony soils with slopes less than 8 percent
 - C-1b Non-stony and stony soils with slopes between 8 and 15 percent
 - C-1c Very stony soils with slopes less than 15 percent
 - C-2 Moderately well drained soils
 - C-2a Non-stony and stony soils with moderately high seasonal water table
 - C-2b Very stony soils with moderately high seasonal water table
 - C-3 Poorly and very poorly drained soils
 - C-3a Non-stony and stony soils with high seasonal water table
 - C-3b Soils with high water table during most of the year
- D - UPLAND SOILS -- ROCKY AND SHALLOW TO BEDROCK
 - D-1 Rocky and very rocky soils with slopes less than 15 percent
 - D-2 Rocky and very rocky soils with slopes more than 15 percent and extremely rocky soils

E - FLOODPLAIN SOILS

- E-1 Well drained soils
- E-2 Soils with moderately high seasonal water table
- E-3 Poorly and very poorly drained soils
- E-3a Soils with high seasonal water table
- E-3b Soils with high water table during most of the year

F - MARSH AND SWAMP SOILS

- F-1 Deep peat and muck soils with high water table during most of the year
- F-2 Soils at or near the coast line that are flooded during high tide

G - LAKE TERRACE SOILS -- OVER STRATA HIGH IN SILT AND CLAY

- G-1 Well drained soils
- G-2 Soils with moderately high seasonal water table
- G-3 Poorly and very poorly drained soils
- G-3a Soils with high seasonal water table
- G-3b Soils with high water table during most of the year

U - OTHER LAND -- UNCLASSIFIED